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Paediatric Community: Healing Environment Conducive Enough?

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Abstract

Healing environment can be simply described as the overall environment (physical and non-physical) created to aid the recovery or healing process. This research is to identify the impact of the physical setting and healing process of hospitalized children, their families and related community. Preliminary studies were conducted and interested argument on how and what are the factors that contributes to the healthcare environment? The methodology for data collection involved site visits, personal observations and photograph documentation, the use of NHS (2008) evaluation toolkits for healthcare buildings – the AEDET Evolution and ASPECT. However, lacking were considerations for pediatric ergonomics and the utilization of audio therapies.

Keywords: Healing environment; paediatric wards; POE; evaluation tools

1. Introduction

Globally, there has been an increase of interests in the creation of the healing environment (Ananth, 2008). Similarly in Malaysia, which envisioned in being a developed nation by 2010, efforts are towards the provision of first-class or optimal infrastructures. What is the design status in relation to the healing

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environment in Malaysia? In particular, the quality of existing pediatric wards, as the pediatric population tended to be more sensitive than adults in the perception of the environment (Ozcan, 2006). Are the physical environment created conducive enough towards quality healing environment? What are the factors involved towards the creation of an optimal healing environment? Those questions prompted the research project that concerned the design of Malaysian pediatric wards in relation to the healing environment. Furthermore, based on initial conversations with senior hospital staffs, it seemed that Post-Occupancy Evaluation (POE) studies had never been conducted upon existing pediatric wards in Malaysia. Hence, the relevance of the currently ongoing research being conducted.

This paper is an outcome of a study done prior to the ongoing research. It aimed to chart the trend in the design of the pediatric wards. The main objective was to identify the degree of conduciveness towards healing in the environment of those existing wards. Significance of the study was in determining deficiencies that could have influenced the creation of a more conducive healing environment. The strategy of the research design was case studies upon exiting pediatric wards built in the past three decades, while the methodology for data collection involved the use of DH Estates and Facilities (2008a, b) evaluation toolkits for healthcare buildings, photographic documentation of the ambience of the wards and questionnaire survey with the hospitals' staffs and patients parent.

2. Literature Review

This section highlighted literatures reviewed relevant to the study, such as, on the creation, role and benefit about the healing environment, with elaborations on the components in the concept of Optimal Healing Environment (OHE).There have been a certain richness and emphasis in the creation of the healing environment. For example, Oberlin (2008) opined that such environment could be created by consideration of factors such as colour, shape, lighting, smell, sound and feel. Berg (2005) meanwhile emphasised more on the contribution of nature, daylight, fresh air and quietness to such environment. The role played by the physical setting in the healing process and more importantly for improving patient outcomes and the well-being of families and caregivers had been stressed by several authors such as Moore (2000) and Visentin (2006). Joseph (2006) concurred about the influence of the physical environment on the healing process and elaborated further that the physical environment also contributed towards a better quality of life not only for the patients, carers and staffs but also the visitors. Moran (1993) suggested that creating a more homelike family environment would give benefit to the children as it encouraged children to feel like at home, active and playful. Varni (2001) involved the "physical and cultural atmosphere created to support families through hospitalization, medical visits, healing and bereavement." (p.30). Proof that such environment might influence patients' and carers perception about their healthcare providers were based on responses about the patients' satisfaction levels, being loyal customers and in helping to promote the healthcare to others, and the quality evaluations made. Inspired by the global interest and development of the healing environment, the Samueli Institute, a medical research organization with interest in investigating the healing processes has developed the concept of Optimal Healing Environment (OHE), which it defined as "one where the social, psychological, physical, spiritual, and behavioral components of healthcare support and stimulate the body's innate capacity to heal itself" (Ananth, 2008, p. 273). The wholesome approach towards the healing process comprised both the inner and outer environment. The inner environment involved developing healing intention, experiencing personal wholeness and cultivating healing relationship, while the outer environment involved practicing healthy lifestyles, applying collaborative medicine, creating healing organization, and building healing spaces as shown in Fig 1. In relation to Anath's (2008) OHE, of interest to the present study related to the building healing spaces part or physical environment which enhanced sensory input. Those involved architecture (which naturally included ergonomics and safety considerations, colour,

artwork, and light), aroma, music, nature, and outdoor playground. Those elements identified not only contributed towards the healing process but also helped the pediatric patients coped with pain and aggression as concluded by NACHR (2008).The importance in ergonomic considerations for the pediatric patients and the related implications had concerned many because the requirements of the children were not the same as the adults. For example, Lueder (2003) detailed out the many differences of the physical built of children as compared to adults. Luder and Rice (2007) elaborated further that children were in continuous development - physically, perceptually, cognitively and socially. Also, Scanlon et. al., (2006) stressed that due to their nature, children during the pediatric age range were more dynamic than the adults and hence characterized many different features which resulted in more potential risks for harm amongst pediatric patients during medical care.

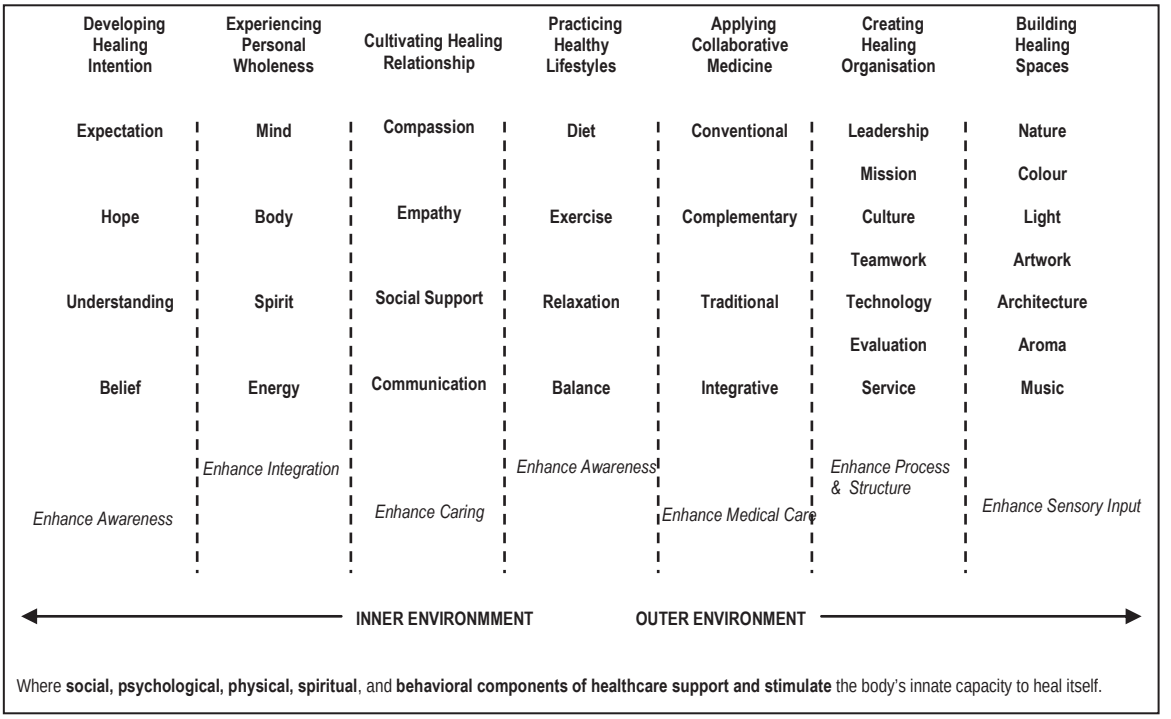

Fig. 1. The Optimal Healing Environment. Source: Sita Ananth (2008), Healing Environments: the next natural step, Explore, Vol. 4, No. 4, p. 274

According to Hourcade (1997), during the course of development, the children's physical maturation affected and limited their capabilities in accomplishing tasks at different age levels. However he argued that maturation did not guarantee that development would occur. As such, rather than the reliance on maturation he suggested that it would be better to ensure technologies (or facilities) being appropriately sized which not only provided better ergonomics but motivated the children to complete their tasks more comfortably. Also, better ergonomics was the outcome in the design details of the facilities provided which empowered patients in taking responsibility for their own health. Such offer of independence is "the power of the healing environment" (Leibrock, 2000).

Safety, a very important factor to be considered especially when involving the paediatric patients should be one of the outcomes of the ergonomically-designed paediatric setting. France, et. al. (2005)

opined that the creation of a patient-centred setting facilitated safe and efficient care and as such human factors expertise were needed to be involved early in the design process. Croasmun (2004) argued that often products or services might have been designed without sufficient knowledge of the end users. As such, improved ergonomics by designing out potential flaws before the occurrence would make a safer setting for the paediatric patients and better environment for the medical carers. In addition, Miller and Zhan (2004) revealed that the prevalence of patient safety events frequently involved the very young with substantial increase in duration of stay. Similarly, Woods, et. al. (2005) cautioned that patient-specific setting increased vulnerabilities and as such patient safety risks must be accounted for in the design and improvement interventions.

In relation to colour as another important component for the OHE, Park (2007) more recently investigated the value of color in real contexts by measuring color preferences amongst healthy children, pediatric patients and design professionals. He found that the use of more color eventually created better environments for children and their families.

Artwork in children's hospital also did provided more cheerful environment and hence contributed towards the pediatric patients' healing process as revealed by several studies such as by Daley (1998), Mallay (2002) and Eisen (2006). The art therapy by Mallay proved to be an effective intervention in coping with ongoing physical, social, cognitive, emotional and psychological squeal of the accident/trauma.

Outdoor environment that could contribute towards the healing environment involved nature and the outdoor children's playground. The role of nature or the creation of therapeutic gardens towards the healing process had been reported by several studies. For example, Whitehouse, et. al. (2001) revealed that garden features in order of users' preferences included the sound of running water, followed by presence of bright colours, flowers, plants and greeneries, artwork, and the opportunity for multisensory stimulation. They also found that very young pediatric patients who were hospitalized for a longer duration or those with physical or developmental disabilities were responsive and appreciative to such gardens. They recommended in the creation of potential activities that could be done in the gardens by the different users, such as outpatient or the patients' healthier siblings. Similarly, Sherman, et. al. (2005) observed the gardens were used differently according to the category of users or their age group. While the most used was the largest garden with direct patient access, children more than adults interacted with the garden features. They also found that emotional distress and pain were lower for all groups when in the garden as compared to in the hospital. Similar findings were also reported locally by Said (2009). In addition, NACHR (2008) concluded that those gardens could help patients to reduce anxiety.

In a survey which involved hospital staff, parents and visitors, about perceptions and their experience of a playgarden, an integration of playgrounds and healing gardens located in a pediatric hospital, Turner (2009) revealed that children's experience during their play in the playground strongly benefited the children's health. He recommended that the physical environment between indoor and outdoor activity be accessible at all times. Also, the playgarden should not only provide space for patients and their families, but also for staff to interact with each other in a park. He also suggested that the playgarden should include a variety of approaches. Annunziato (2002) emphasised on features like a river that flows along the window wall which included trees, native plants, and whimsical animal sculptures could helped ease the fear of children and provide a space for siblings to play, as well. The evidence by Annunziato is to ensure that a sense of welcoming and playful environment appeared in the children's hospital somehow would reduce patients and staff stress, improved patient safety and improved overall healthcare quality.

In relation to music therapy, several studies done such as by Evans (2002), Robb and Ebberts (2003), and Cooke, et al (2005) found that music is a simple and cost effective intervention in the hospital which decreased anxiety experienced while patients undergo their invasive investigation, treatment, procedures or surgery. Statistical analyzed data by Robb (2000) revealed the effect of therapeutic music interventions

on the behaviour of hospitalized children. The music therapy overcome and supported the other activities typically experienced by hospitalized children. He also found that positive behavioural effect by the proposed music interventions.

Kennelly and Brien-Elliott (2001) concurred that music therapy played a role in Paediatric Rehabilitation which is becoming acknowledged in the global interest of health care as a therapy that are able to meet the expansive needs of the patient in rehabilitation. Kennelly (2000) encouraged paediatric healthcare providers to use music in their work settings and especially in order to help paediatric patients to heal faster and to achieved best practice outcomes in this field.. Other studies had shown that music therapy reduced stress levels and benefited not only paediatric patients but also others in the wards. Those were as reported for example by Routhieaux and Tansik (1997) upon visitors in a hospital surgery and intensive care unit waiting room, and Stewart (2009) upon infants, parents and caregivers. Meanwhile, Stouffer, et al (2007) suggested the use of music as therapy in the paediatric practice guidelines in order to promote in the healing process.

As regards to aromatherapy Bonadies, (2009) found that pleasant aroma in the hospital can improve health and enhance well-being, particularly through the reduction of pain and anxiety. Similarly, Holm and Fitzmaurice, (2008) reported that the effect of aromatherapy is a useful way to decrease stress and anxiety levels of parents who accompany their children in waiting area of an emergency department.

3. Methodology

The strategy of the research design chosen was Post-Occupancy Evaluation (POE) upon existing paediatric wards of hospitals within the Klang Valley region in Malaysia. The main criterion for the selection of the hospitals chosen was the year it was built which represented the design of each of the last three decades - the 1980s, 1990s and 2000s. It was envisaged that samples for such purposeful selection could depict the design trend of such building type.

The main methodology for data collection involved the evaluation of the physical environment which used DH Estates and Facilities (2008a, b) evaluation toolkits for healthcare buildings, namely AEDET (Achieving Excellence Design Evaluation Toolkit) Evolution and ASPECT (A Staff and Patient Environment Calibration Toolkit). As a supplement to the evaluation tools, photographic documentation of the ambience of the wards and informal unstructured interviews with the hospitals' staffs were also conducted.

3.1. Evaluation Toolkits

3.1.1. The AEDET (Achieving Excellence Design Evaluation Toolkit) Evolution

This is part of a benchmarking tool which assisted in measuring and managing the design quality in the healthcare facilities. Based on the lessons learned from an academic evaluation of its use, the AEDET Evolution is the newer version to the former AEDET toolkit (Fig 2), a best practice guide for the evaluation of design quality published in 2001. In terms of reliability, the AEDET Evolution includes references to evidence based design literature and this is related to the criteria used in the evaluation. In terms of validity, its use is mandatory in business case submissions for major capital development.

1) IMPACT: As a sense of place to users and neighbours	
a) Character and innovation	Deals with the overall feeling of the building. [Design concept? Interesting? Caring & reassuring atmosphere? Influential design?]
b) Form and materials	Deals with the nature of the building in terms of its overall form and materials. [Of human scale? Welcoming? Sunlight availability maximized? Prevailing winds sheltered? Entrance – obvious & logically positioned? External materials –detailing, high quality? External colours & textures – appropriate & attractive?
c) Staff and patient environment	Deals with how well an environment complies with best practice as indicated by the research evidence. [Allowance for privacy / dignity? Good views – inside / outside? Good outdoor access for patients/staffs? Comfortable? Control of comfort? Building clearly understandable? Interior attractive? Good bath/toilet and other facilities for patients? Good facilities for staff, including convenient places to work and relax?
d) Urban and social integration	Deals with the way the building relates to its surroundings. [Height, volume, skyline of the building relate well to surrounding environment? Building contributes positively to its locality? Hard/soft landscape contributes positively to the locality? Building sensitive to neighbours and passers-by?]
2) BUILD QUALITY : Physical components rather than spaces	
a) Performance	Concerned with the technical performance of the building during its lifetime. [Building easy to operate? clean? of durable finishes? weather and age well?
b) Construction	Concerned with the technical issues of actually constructing the building and with the performance of the main components. [Not applicable for the present study]
c) Engineering	Concerned with those parts of the building that are engineering systems as opposed to the main architectural features. [Engineering systems are well designed, flexible and efficient? Energy efficient? Emergency backup systems available?]
3) FUNCTIONALITY : Primary purpose of the building	
a) Use	Concerned with the way the building enables the users to perform their duties and operate the healthcare systems and facilities housed in the building. [Brief requirements satisfied? Optimal circulation? Flexible? Facilitates security & supervision?]
b) Access	Focuses on the way the users of the building can come and go. [Accessibility? Adequate parking? Appropriate ambulance access? Circulation for services good and segregated? Pedestrians' route, obvious, pleasant, inclusive? Outdoor safe lighting?]
c) Space	Concentrates on the amount of space in the building in relation to its purpose. [Appropriate space standards? Good ratio of usable space? Minimised circulation distances? Gender segregation? Adequate storage space?

Fig. 2. Achieving Excellence Design Evaluation Toolkit (AEDET) Evolution : Summary of components measured. Source: DH Estates and Facilities (2008a) evaluation toolkits for healthcare buildings, NHS, UK.

3.1.2. The ASPECT (A Staff and Patient Environment Calibration Toolkit)

This measures the manner the healthcare environment can impact both on the satisfaction levels to patients, and provision of facilities to staffs. It evaluates eight sections as follows (Fig 3):-

1.0 Privacy, company and dignity: deals with the way people are able to control their privacy and their interaction with others.
1.01 Patients can choose to have visual privacy
1.02 Patients can have a private conversation
1.03 Patients can be alone
1.04 Patients have places where they can be with others
1.05 Toilets/bathrooms are located logically, conveniently and discretely
2.0 Views deals with the extent to which both staff & patients can see out of and around the building.
2.01 Spaces where staff and patients spend time have windows
2.02 Patients and staff can easily see the sky
2.03 Patients and staff can easily see the ground
2.04 The view outside is calming
2.05 The view outside is interesting
3.0 Nature and outdoors deals with the extent to which patients in particular have contact with the natural world.
3.01 Patients can go outside
3.02 Patients and staff have access to usable landscaped areas
3.03 Patients and staff can easily see plants, vegetation and nature
4.0 Comfort and control deals with the comfort levels of the staff & patients & the extent to which they can control those levels.
4.01 There is a variety of artificial lighting patterns appropriate for day and night and for summer &winter
4.02 Patients and staff can easily control the artificial lighting
4.03 Patients and staff can easily exclude sun light and day light
4.04 Patients and staff can easily control the temperature
4.05 Patients and staff can easily open windows/doors
4.06 The design layout minimises unwanted noise in staff and patient areas
5.0 Legibility of place deals with how understandable healthcare buildings are to the staff, patients and visitors who use them.
5.01 When you arrive at the building, the entrance is obvious
5.02 It easy to understand the way the building is laid out
5.03 There is a logical hierarchy of places in the building
5.04 When you leave the building, the way out is obvious
5.05 It is obvious where to go to find a member of staff
5.06 Different parts of the building have different characters
6.0 Interior appearance deals specifically with the interior of healthcare buildings and in particular what they look like.
6.01 Patients' spaces feel homely
6.02 The interior feels light and airy
6.03 The interior has a variety of colours , textures and views

6.04 The interior looks clean, tidy and cared for
6.05 The interior has provision for art, plants and flowers
6.06 Ceilings are designed to look interesting
6.07 Patients can have and display personal items in their own space
6.08 Floors are covered with suitable material
7.0 Facilities deals with a number of facilities that have been found to be important for the users of healthcare buildings particularly patients.
7.01 Bathrooms have seats, handrails, non-slip flooring, a shelf for toiletries and somewhere to hang clothes within easy reach
7.02 Patients can have a choice of bath/shower and assisted/unassisted bathrooms
7.03 There is a space where religious observances can take place
7.04 There is a place where live performances can take place
7.05 There are easy chairs, tables and desks in the patients' spaces
7.06 Patients have facilities to make drinks
7.07 There are easily accessible vending machines for snacks
7.08 There are facilities for patients' relatives/friends to stay overnight
8.0 Staff is concerned with those aspects of healthcare building provision that relate specifically to staff.
8.01 Staff have a convenient place to change and securely store belongings and clothes
8.02 Staff have convenient places to concentrate on work without being on demand
8.03 There are convenient places where staff can speedily get snacks and meals
8.04 Staff can rest and relax in places segregated from patient and visitor areas
8.05 All staff have easy and convenient access to IT
8.06 Staff have convenient access to basic banking facilities and can shop for essentials

Fig. 3. A Staff and Patient Environment Calibration Toolkit (ASPECT): Summary of components measured. Source: DH Estates and Facilities (2008b) evaluation toolkits for healthcare buildings, NHS, UK

In terms of reliability and validity, the ASPECT is based on a database of over 600 pieces of research.

3.1.3. Procedure

Prior to the site visits, consents were first obtained from the directors of the hospitals identified through formal applications. Preceded by initial briefings about the setup of the hospitals, representatives from the hospitals accompanied the site visits and provided responses to spontaneous general enquiries about the physical environment of the wards. Data collected involved personal observations made with notations and photographic documentations about the facilities provided and the ambience. The AEDET Evolution and ASPECT evaluation toolkits were then filled. Due to confidentiality, permission was not granted to interview patients and view patients' medical records. That required approval from the Ministry of Health. Also visits to the hospitals which were done once and lasted about 4 hours per hospital. Security was noticeably tight with security personals stationed immediately outside all the wards.

4. Results and Discussions

The aim is to determine the degree of conduciveness of Malaysian paediatric wards which has affected the wellbeing of the paediatric community in relation to the physical healing environment over the last three decades. Paediatric wards of four hospitals were specifically selected which depicted the design of each of the past three decades. Physical components which could influence the healing environment as identified in the literatures reviewed were considered in the evaluation toolkits of AEDET Evolution used in the post-occupancy evaluation of the four paediatric wards as shown in Fig 4.

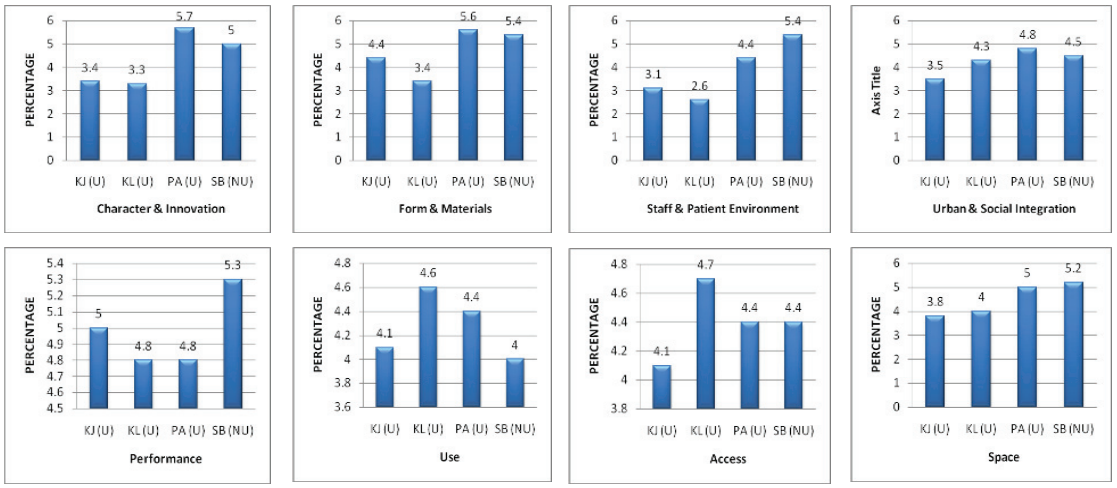

Fig. 4. Achieving Excellence Design Evaluation Toolkit (AEDET) Evolution – Summary of Findings

Overall, results of the analysis suggested positive for condusive environment in Malaysian paediatric wards towards the creation of a better healing environment. In relation to the design quality of the wards, most marked was in the tremendous improvement that concerned the staff and patient environment. Similarly, of notable improvements were in sections that concerned both the character and innovation, and form and materials of the wards designed. Slight improvements were observed in sections that involved urban and social integration, building performance, and access and space of the wards. In relation to the impact of satisfaction levels upon both staffs and patients, most marked in improvement concerned the provision of nature and outdoor, and matters that concerned privacy, company and dignity as shown in Fig 5 and Fig 6.

Despite the positive for conducive design trends in most of the sections considered, there still remained matters of concern on some sections, the trend of which tended to depreciate slightly in amongst the newer wards. In relation to the design quality, in particular on the section which concerned the way the building enabled the users to perform their duties and operate the healthcare systems and facilities housed in the building.

Similarly, pertaining to the impact of satisfaction levels upon both staffs and patients were on sections on legibility of place, comfort and control, and interior appearance. The layout of the building should be easily understood for the convenience of all users. Also, patients should be provided options to control in attaining their comfort. In addition, the interior appearance and ambience should be conducive towards healing.

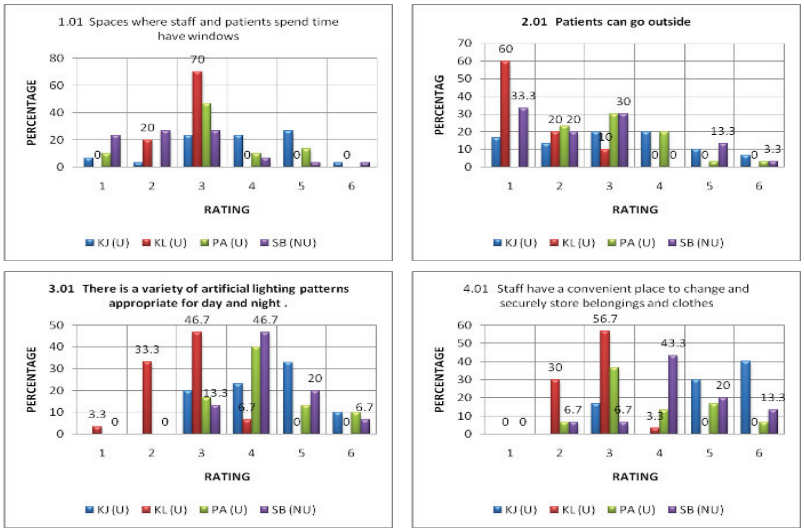

Fig. 5. A Staff and Patient Environment Calibration Toolkit (ASPECT). Questionnaires Distributed to Staff – Summary of Findings

A further analysis based on questionnaires distributed to staff and it seemed that staff and patients are slightly improving in terms of spending their times near the window. However, patients are not allowed to go outside for most of the hospital. In terms of internal environment which variety artificial lighting for day and night, it shows a positive improvement for most paediatric wards. While there was a slight improvements for staff environment where they have a convenient place to work and other activities.

Overall, results of the analysis based on questionnaires distributed to patients and it seemed that patients has fairly agreed in terms of viewing, spending time near the window and activities outside the wards. Thus, positive improvements regarding the artificial lighting, hospital entrance, and patient's spaces feel homely and easy reach in the bathrooms.

Other matters of concern relate to best practices that involved ergonomics, and the provision of art therapy, music therapy, and aromatherapy.

Ergonomic considerations for the paediatric population were observed in all the four hospitals in the provisions of beds, chairs and tables in the mini library, and counter top at the registration section. However, surprisingly those were not considered markedly in the facilities provided in the bathrooms which suited only the adults. Another surprise was that the staffs opined those to be not an important provision as most of the patients were in diapers, and that the bathrooms were mainly used by the patient's parents or carers. While that might be the case, perhaps an optimal situation could have been achieved if provisions in the bathrooms were ergonomically designed for the paediatric population, particularly for the more independent older age group of 12-year olds and older. Notable absence even in the newer wards was the provision of art therapy, music therapy, and aromatherapy. Those provisions require serious considerations by the healthcare providers if an optimal healing environment was to be attained.

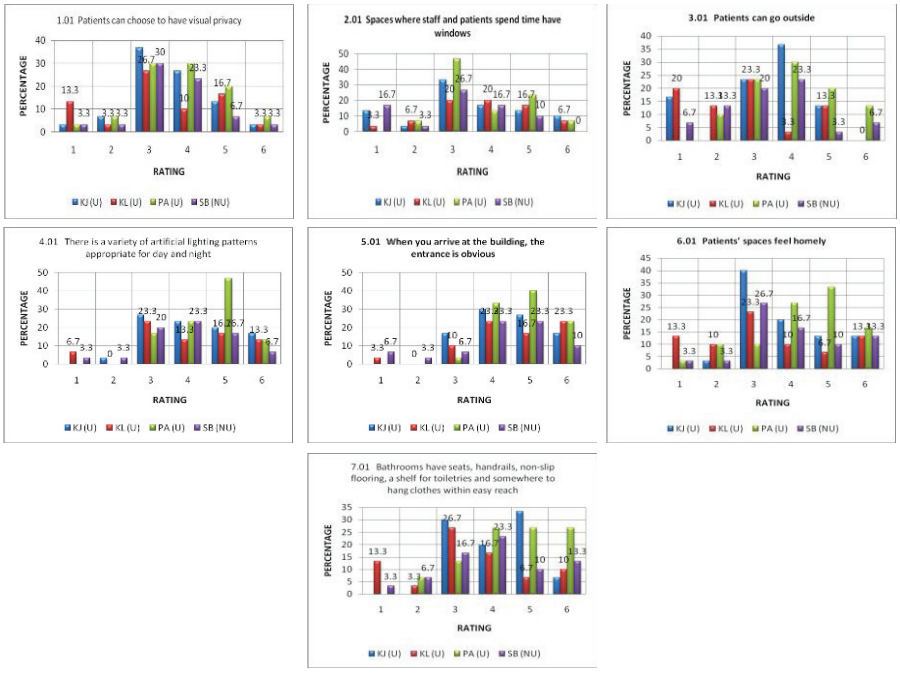

Fig. 6. A Staff and Patient Environment Calibration Toolkit (ASPECT). Questionnaires Distributed to Patient – Summary of Findings

The hypotheses proposed that the physical environment would influence the length of stay of hospitalized paediatrics. However, it seemed that once the patient recovered from their illness, patients will discharge within 1-5 days and it is also depending on their sickness. The analysis also shows that patient at the age 3 years old are mostly warded at most hospitals. Thus, highly diagnosis distribution (type of sickness) related to Asthmatic, Bronchopneumonia, Tonsillitis, Allergic Asthma, Respiratory Infection and Pneumonia. Second highly diagnosis distribution related to Diarrhoea and Gastroenteritis, Dengue Fever and other Convulsions. Thirdly diagnosis distribution (type of sickness) related to fractured, superficial injuries and wound concussion as shown in Fig 7.

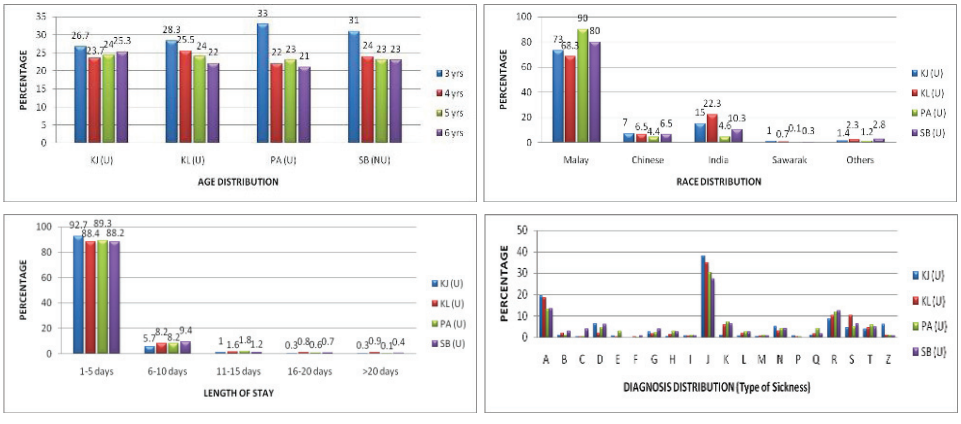

Fig. 7. Statistic Data from Hospitals – Summary of Findings

5. Conclusion

In conclusion, there seemed to be a positive in relation of conduciveness towards the creation of healing environment in the newer paediatric wards built. However, there seemed to be a startling lack in consideration on ergonomics for the paediatric population and the absent in the provisions of art therapy, music therapy, and aromatherapy. Those should be seriously considered not only in the design of newer paediatric wards, but also in upgrading the older wards for the benefit of the paediatric population.

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